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FOREST PLANTING LEAFLET.

GREEN ASH (*Fraxinus lanceolata*).

FORM AND SIZE.

The green ash, when forest grown, is a medium-sized, round-topped tree with a straight, undivided bole and slender, spreading branches. It rarely exceeds a height of 60 feet and a diameter of 24 inches. Deep-seated, fibrous roots, which extend laterally, form the characteristic root system.

RANGE.

Green ash is distributed over the greater part of the United States east of the Rocky Mountains, even extending into those mountains in Utah and New Mexico; it occurs to the north as far as the Saskatchewan River in Canada. It is most abundant in the Mississippi basin, and is rather infrequent in the East. In the timber belts along the streams that drain the plains and prairie country of the Middle West the green ash sometimes occurs as the leading species, but in general, especially in the East, it appears singly or in small groups among other hardwoods. The species most commonly found in such natural mixtures are the white elm, hackberry, sycamore, black cherry, red ash, and bur oak.

At the present time the range for economic planting of green ash hardly exceeds that of its natural distribution. It is probable that this tree will prove valuable for planting on irrigated lands, in regions now being developed throughout the arid West.

HABITS AND GROWTH.

The green ash attains its best development on low, moist ground; yet it can be grown more successfully on the upland than most other

trees. Its growth in such situations, however, is much slower than on the deep soil of the river bottoms. The tree is alkali resistant to a marked degree. It does not demand a rich soil and makes a fair growth on dry sandy loam or on stiff clay upland. Its ability to persist and even thrive under adverse conditions of temperature and moisture is very great. On the arid plains of western Kansas and Nebraska it has survived on abandoned timber claims where nearly all other species have been a failure.

Green ash prefers full light and tolerates only moderate shade.

In semiarid regions the rate of growth is not rapid. In regions of greater rainfall it compares favorably with that of other broad-leaved species, though green ash is never a rapid-growing tree. Under average conditions planted trees should attain post size in fifteen or twenty years and be large enough for stakes or fuel in less time. Stands measured in the Middle West show a diameter growth of from 0.2 to 0.3 inch annually.

Several insects infest the green ash. In case insects appear in alarming numbers, upon natural or planted trees, specimens should be sent to the Bureau of Entomology, Department of Agriculture, where they will be identified and measures suggested for their control. The chief climatic influence injurious to the green ash is a protracted growing season followed by severe frost. The resultant damage, however, is only temporary in its effect and the tree soon recovers.

ECONOMIC USES.

The wood of the green ash is hard, heavy, and strong, rather coarse grained, and brittle. It is utilized in the manufacture of agricultural implements, carriages, and furniture, and for general farm repair work. Although said to be inferior in quality, it is substituted for white ash to a large extent, and ash timber is often sold without discrimination between the two species. The relative fuel value of the wood is high, but because of the slow rate of growth, planting for the production of fuel is not advisable if a more rapid growing species can be grown successfully.

Although not strictly first class for fence posts, it is used for this purpose extensively in portions of Nebraska, Iowa, Minnesota, and the Dakotas, and is highly prized in many sections where more valuable species are not available. The easy propagation, and great hardiness of the green ash make it one of the most valuable trees for general planting in semiarid regions. It serves a useful purpose, whether planted for windbreak, ornament, or timber. Since the wood is inferior to that of white ash and many other species, the propagation of green ash in regions of abundant rainfall is not recommended.

METHODS OF PROPAGATION.

Green ash reproduces by seed and sprouts. Propagation by seed is the best method. Seed may be purchased from dealers for from 50 to 75 cents per pound, but wherever possible it is advisable for the local planter to gather his own supply. The several species of ash seeds are very similar in appearance, and the germination per cent low at best; hence it is advisable to send samples of seed, whether purchased or home gathered, to the Seed Laboratory of the United States Department of Agriculture, where all seeds will be identified and tested without charge.

Green ash matures its fruit in early autumn. Collecting should be begun as soon as the seeds ripen, by stripping them from the trees by hand. Fall planting may be practiced, but is in general inadvisable. The seeds may be kept over winter in a cool, dry place or stratified. If stored dry, the seed should be soaked in warm water for several hours before planting in the spring. If stratified, the winged seeds should be placed between alternating layers of slightly damp sand in boxes, and the boxes stored in a cool cellar. The seeds are not likely to retain their vitality more than eight months.

Broadcast sowing on prepared or unprepared ground, or even planting the seed in hills where the trees are to stand, is generally unsatisfactory; hence nursery culture is advised. The nursery and seedbeds should be prepared on rich, well-worked ground, an old garden spot being an excellent site if the soil is not too full of weed seeds. Planting may begin in spring as soon as danger of frost is over. For convenience in weeding, the seed should be sown in drills 8 to 12 inches apart for hand cultivation and 2 to 3 feet apart for a horse cultivator. The normal germination per cent is rather low, hence the seeds should be dropped thickly enough to touch each other in the row. They should be covered about one-half inch deep and the soil rolled firmly, or pressed down with a board. In the arid regions it is sometimes best to cover seed with 2 or 3 inches of soil until after germination is well started, after which the dry surface layer should be raked off, leaving a covering a little less than a half inch in depth. A mulch of chaff, sawdust, or old hay, if kept moist and raked off when the sprouts begin to break the ground, will answer the same purpose. Uniform moisture conditions should be maintained by surface irrigation, sprinkling, or mulching.

PLANTING.

The seedlings will attain a height of 6 to 10 inches the first season, and should be translated to the permanent planting site when 1 year old. If the plantation is small and only a few seedlings are

